

Protecting the Chattahoochee River

Developer uses proactive approach to erosion and sediment control to ensure clean, clear water.

CHATTAHOOCHEE Bluffs Community is made up of 224 three-story homes; entirely surrounded by the Chattahoochee Nature Center. It is centrally located in Metro Atlanta, Georgia, less than a mile from I-75 inside I-285, and accessible to shopping and downtown Atlanta within minutes. The beauty of the community includes walking trails near the subdivision that lead down to the Chattahoochee River.

The Chattahoochee Bluffs Community was built in 2004 by the Pacific Group, a local development group. Woody Snell, partner of Pacific Group and Cobb County Soil and Water Conservation Commission supervisor, understands the effects of development, road building, and land disturbing activities on the environment. Issues with erosion, sedimentation, and stormwater runoff prompted him to choose to be proactive and prevent any negative impact on the National Forest and the Chattahoochee River from planning to completion of the project.

Knowing that the project was extremely sensitive, Snell contacted Applied Polymer Systems to ensure



An inlet sediment trap is used to prevent silt from entering the pipe system at an inlet.



The baffle grid is for use in conjunction with a stormwater treatment system to flocculate the suspended particles, making larger particulate that can easily be removed from suspension.

proper erosion and sedimentation control methods were implemented assuring clear, clean water was discharging from the construction site. Initial site visits determined the areas that could be problematic, requiring special erosion control measures. Polymer Enhanced Best Management Practices were designed using site specific floc logs and powders in conjunction with mixing chambers, plunge pools, and baffle grids. Site visits were made throughout the project to make any adjustments necessary to ensure optimum water quality.

Soil and water samples were taken from the site to determine the specific polymers required for the soil lithology and water chemistry. APS Silt Stop was used as a soil stabilizer preventing the detachment and transport of sediment during rain events. Additionally APS Floc Logs were used to flocculate and settle out sediment and silt particles solubilized during rain events. Soil samples taken and tested in the laboratory determined the soil to be very problematic once it goes into solution and very difficult to treat and flocculate out.

As a result two different types of logs were required to achieve optimum results. During the course of a bench test a slurry was made from the soil representative of the water on the site with an initial NTU of 1140 and was treated by the logs resulting with a final NTU level of 50.



By constructing a floc log mixing chamber, a baffle grid, the water can be channeled through the system creating the mixing required to allow the system to react and the particulate to flocculate out.

This NTU level was higher than the standard that Applied Polymer Systems strives for so it was important that the soil specific powder, in this case the APS 712 Silt Stop powder, be applied to any bare, exposed or disturbed soil. This powder acts by stabilizing the soil which prevents sediment and silt from dissolving into solution during rain events.

System Construction:

The polymer enhanced BMP required for this difficult site was chosen based on the terrain layout utilizing a small natural valley where the entire site runoff was channeled, diverted or piped to a valley using gravity flow. The enhanced system needed to be a passive design requiring as little maintenance as

possible to keep cost to a minimum so the sediment basin was reduced in size to function only as a grit pit large enough to capture sand and very coarse grit, better



During excavation the site was stabilized with polymer enhanced soft armoring.

know as a grit pit. From the grit pit the turbid water would enter into a polymer enhanced mixing chamber containing polymer floc logs followed by a smaller grit pit and then through a baffle grid and directly discharged to the environment.

The mixing chamber provided the required mixing and time to produce

heavy particulate from the fine sediment and colloidal water from rain events leaving the primary grit pit. The logs were installed within the mixing chamber based on a design flow of 12,800 gpm. The numbers of logs were determined based on the soil and water testing that was conducted at the time of clearing and grubbing and found to be 100 gpm / each log. As the treated water exited the mixing chamber the water and particulate were allowed to settle in a mini grit pit. The particulate was now very heavy containing all the fine sediment, metals, nutrient and turbidity settling out in a matter of seconds. This mini grit pit required cleaning after large storm events but could be done in a few minutes.

The water then entered into the baffle grid system. The baffle grid mimics the functions as would a lamella clarifier used in water treatment plants. As the water leaves the mini grit pit it still contains fine particulate that needs to be filtered or captured. As the water flows into the baffle grid the fine polymer treated particulate contacts the surface of the grid and attaches. As more particulate



The soil-specific Silt Stop is then applied on top of the matting; the powder reacts with the metals and clays within the soil to bind it together. A series of wattles are placed in conjunction with the soft armoring and perpendicular to the flow to create a series of checks that will trap sediment and collect particulate created by a stormwater treatment system placed upstream.

enters the system, the added particulate attaches to the surface of the existing particulate, building up and falling to the bottom of the grid system. The principal is the same as is used in dead bed water treatment plants utilizing lamella clarification. This system can function for years without maintenance if it only treats

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turbid water. After treatment the water can enter directly into the environment due to the absence of aquatic toxicity potential. This BMP system was removed at the completion of the project approximately a year and a half ago.



Influent water into the system.

Performance:

All sampling followed the Georgia NPDES Phase 2 monitoring protocol. Typical NTU discharges from light to moderate rain events are less than 10 NTU from a properly designed and constructed system. Large grid systems have



The site is now fully stabilized and as a result there is a reduced amount of sediment leaving the site.

shown NTU discharges below 5 NTU. The first rain event reported from this system was 2.5 NTU, from the greater than 1100 NTU influent from the primary grit pit. This polymer enhanced BMP baffle grid saw two 100 year storm events and 97 additional rainfall events while maintaining an average NTU discharge to the environment of 18 NTU.

The Chattahoochee Bluffs Project was closely monitored to ensure it stayed within compliance. The project was able

to proceed throughout its entirety with no Notice of Violations or fines. The water being discharged was as low as 2.5 NTU and averaged 18 NTU. This project showcases how natural resources can be protected before, during and after the development of a community of 224 three story homes with the use of polymer enhanced best management practices. Today families enjoy a community surrounded by the Chattahoochee Nature Center, National Forest, and Chattahoochee River that boasts a decorative furnished clubhouse with a fitness center and large pool only minutes away from downtown Atlanta. **L&W**

For more information, contact Katie Bridges, Applied Polymer Systems, (678)494-5998, info@siltstop.com.

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